عنوان مقاله:

Characterization of Sangan low-grade iron ore and its processing by dry low-intensity magnetic separation

محل انتشار:

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خلاصه مقاله:

In Sangan iron mine nearly two million tons of low-grade iron ore has been extracted and deposited in the mining site and currently no action is made on them. On the other hand, the mining site is located in the semi-arid region and wet processing has been restricted due to water shortage. In this research, the upgradation of Sangan low-grade iron ore from mine B has been performed by dry low-intensity magnetic separation (DLIMS) to solve both problems of unprocessed low-grade iron ores and water scarcity. The X-Ray diffraction analysis showed that the ore minerals of the sample are magnetite and to less extent hematite and the main gangue minerals of the sample are quartz and calcite. The Fe, FeO and sulfur contents of the sample were determined to be 36.86%, 8.1%, and 0.12%, respectively. The scanning electron microscopy equipped with energy dispersive X-ray analysis showed that the full liberation of the iron minerals is achieved in the particle size less than 30 μm. The Davis Tube tests in three different magnetic field intensities of 1420, 2340 and 3800 Gauss confirmed the good amenability of the low-grade iron ore to low-intensity magnetic separation. A concentrate assaying 47.15% Fe with a yield of 68.56% was produced by DLIMS. The process development for the upgradation of Sangan low-grade iron ore by DLIMS was performed and a flowsheet was proposed. The results showed that after two steps of DLIMS it is possible to produce a concentrate with iron grade more than 50% which can be sold as high-grade iron ore or fed to the on-site processing plants.

کلمات کلیدی:

Sangan mine, Low-grade iron ore, Characterization, Dry processing, Flowsheet